

Session: Underground Cable Laying

Learning Objectives	Evaluation Criteria
Explain the two different ways of laying a cable	Interactive Questioning



Duration 30 Minutes



Resources PowerPoint Presentation, Whiteboard, Markers, Screen and Projector



Facilitator’s Notes In this session, use video snippets and take the participants through an interactive presentation on the two different ways of laying a cable.

End of Note



1. Tell:

Welcome to the video presentation on “Underground Cable Laying”.

In this session, we will see the two different ways of laying a cable. The first is trenchless cable laying. The second is laying cables in open trenches.



Facilitator’s Notes:

- Display the slide
- Read out the objectives and ask learners to note them
- Inform them that they will be asked questions during the session

End of Notes



2. Tell:

By the end of this session, you will be able to explain the two different ways of laying a cable.



3. Tell:

Before we begin the session, let me ask you a few questions.

Ask:

- What is cable laying and how can we do it?
- What do you mean by trenchless cable laying?
- What do you mean by open trenches?
- What is the difference between trenchless cable laying and laying cables in open trenches?

Facilitator’s Notes:

- Display the slide
- Ask the questions one after the other
- Randomly select a few participants and ask questions

- Encourage the participants to respond
- Capture the responses on the whiteboard
- Appreciate the participants for their effort

Tell:

Let us now understand the concept of laying cables with the help of videos.



4. Tell:

Here, you can see that the helper is digging a pit for laying a trenchless cable of 11 KV rating or HT feeder.

Facilitator's Note:

Click to play the video.



5. Tell:

Boring is being carried out with a trenchless machine by injecting water into the soil.

Facilitator's Note:

Click to play the video.



6. Tell:

The black pipe here is an HDPE pipe of 160 mm diameter.

Facilitator's Note:

Continue to play the video.



7. Tell:

A wire is kept inside the pipe to keep the cable safe.

Facilitator's Note:

Continue to play the video.



8. Tell:

Roller stools are placed beneath the HDPE pipe for smooth sailing without it being subject to drag and stress.

Facilitator's Note:

Continue to play the video.



9. Tell:

The cable is attached to the drum jack and the drum is turned upwards.

Facilitator's Note:

Continue to play the video.



10. Tell:

The cable is pulled up to the pit with the help of rollers.

Facilitator's Note:

Continue to play the video.



11. **Tell:**
A Chinese finger is kept at the tip of the cable.

Ask:

What do you mean by a Chinese finger?

Possible Responses:

- A cable socketing
- Cable grip

Ask:

What is the use of a Chinese finger?

Possible Responses:

- To hold an object
- Used for cables
- Used for pulling
- Used for cable socketing

Tell:

That's correct. The Chinese finger is attached to the pipe-pulling rod at the bottom.

Facilitator's Note:

Continue to play the video.



12. **Tell:**
As per standard regulation, the depth for laying an HT cable should be more than one meter.

Facilitator's Note:

Continue to play the video.



13. **Tell:**
The depth is more than one meter where the cable is laid.

Facilitator's Note:

Continue to play the video.



14. **Tell:**
Let us now look at the process of cable pulling.

Facilitator's Note:

Continue to play the video.



15. **Tell:**
The crew places additional roller stools, so that there is no pressure on the cable.

Facilitator's Note:

Continue to play the video.



16. Tell:

The cable is pulled with the help of the trenchless machine. After pulling for 3 meters, the rod will be opened and removed. Likewise, another rod will be removed after each pull.

Facilitator's Note:

Continue to play the video.



17. Tell:

Let us now know how to prepare the straight with joint.

Facilitator's Note:

Continue to play the video.



18. Tell:

The cable supplied on the drum has a length of up to 250-300 metres.

Facilitator's Note:

Continue to play the video.



19. Tell:

We need to prepare an XLPE joint. This requires extra digging to accommodate the process for the joint. After digging, we need to make joints at both the cable ends to ensure cable continuity.

Facilitator's Note:

Continue to play the video.



20. Tell:

Let us look at the heat treatment process of a straight through joint.

Facilitator's Note:

Continue to play the video.



21. Tell:

Here, you can notice that the joints have been successfully made.

Facilitator's Note:

Continue to play the video.

Tell:

This is the manner in which underground cables are laid with the help of machines and underground joints.



22. Tell:

Let us now learn about the cable-laying process in an open trench.

We will see trench excavation for cable laying and dimensions of the depth as per existing CEA standards.

Let us see a double circuit HT 11 KV cable laying process in a trench.

Facilitator's Note:

Continue to play the video.



23. **Tell:**

After laying the cable in the pit, it is covered with sand. Then, docketing is done with bricks. The trench is filled with the remaining soil.

The depth of the trench is maintained at 1.05 metres as per measurement. The width of the trench is 140 cm, which has to be evenly maintained.

Facilitator's Note:

Click to play the video.



24. **Tell:**

So far, you have seen how the two circuits are laid in a trench in parallel.

Let us now watch how a sand bed is provided on the cables.

Facilitator's Note:

Click to play the video.



25. **Tell:**

Docketing of bricks is done to provide mechanical strength to the cables.

Facilitator's Note:

Continue to play the video.



26. **Tell:**

Once docketing is done, the trench is filled first with soft soil and then the hard soil left on the sides of the trench dug earlier.

Facilitator's Note:

Click to play the video.



Tell:

With this, we have learnt underground cable laying and the process of joining the cables.

We have also seen how a trench is prepared to lay two parallel HT cables in the open trench method.

Key Learning Outcomes



27–
28. **Tell:**

Let us quickly recollect the key points of this session.

- We need to dig a pit to lay a trenchless cable of 11kV rating or HT feeder
- Boring is carried out with a trenchless machine by injecting water into the soil
- Roller stools are placed beneath the HDPE pipe for smooth movement of the pipe without any drag or stress

- To lay an 11 KV HT cable using the trenchless technique, you must:
 - Attach the cable with the drum jack
 - Move the cable up to the pit with the help of rollers
 - Pull the cable with the help of a D-clamp
- Heat treatment process is required to prepare the straight through joint
- To lay a cable in an open trench, a double circuit is excavated
- The circuits runs parallel in the trench with a brick padding in between
- The trench must be refilled with the soil accumulated during digging and the surface smoothed thereafter
- Docketing of bricks is done to provide mechanical strength to the cables